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# The Groningen Active Living Model, an example of successful recruitment of sedentary and underactive older adults

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ABSTRACT

*Objective.* Many physical activity interventions do not reach those people who would benefit the most from them. The Groningen Active Living Model (GALM) was successful in recruiting sedentary and underactive older adults.

*Method.* In the fall of 2000 older adults in three municipalities in the Netherlands received written information, were visited at home and, if eligible according to the GALM recruitment criteria, filled in the Stages of Change questionnaire and the Voorrips physical activity questionnaire.

*Results.* By using the strategy we succeeded in including 12.3% of the older adults (315 of the 2551 qualifying participants), 79.4% of whom could be indeed regarded as sedentary or underactive. These results can be considered in line with results described in the literature. The cost of successfully recruiting an older adult was estimated at $84.

*Conclusions.* The GALM recruitment strategy is a potentially useful and effective method for reaching community-dwelling sedentary and underactive older adults.



## Introduction

Despite proven benefits, many physical activity interventions do not reach those people who would benefit the most. The Groningen Active Living Model (GALM) originated from this need for a more tailored approach. GALM is a behavioral change strategy for stimulating physical activity in sedentary and underactive older adults aged 55–65, and consists of a recruitment strategy and a recreational sports activity program (Stevens et al., 1999). Until 2005, 552,094 persons were approached in 424 projects. However, reports on effective means of recruiting participants for programs like GALM remain scarce. Most research emphasizes outcome, with little attention given to which recruitment strategies are most successful (Rowland et al., 2004). This paper reports on the effectiveness of the GALM strategy to recruit sedentary and underactive older adults.

## Methods

### Participants

This study was part of research into effects of participation in GALM on health and fitness. The recruitment took place in three Dutch municipalities, in four neighborhoods that were assigned as intervention or control neighborhoods (fall 2000). Intervention neighborhoods underwent a recreational sports activity program. Control neighborhoods underwent the program after being placed on a waiting-list (6 months). In the context of reporting about effectiveness of the strategy, both groups were put together.

### Recruitment strategy

The approach comprised a population and network strategy. In the population strategy about 700 older adults in a selected municipal area received a written invitation (based on the municipality's population data) and were visited at home by a trained employee. When older adults could not be reached, a second visit was planned during dinnertime the same day. If this attempt was unsuccessful, a reminder card was left behind asking to respond by mail or telephone. As attending by oneself is often a barrier, potential participants were invited to bring someone along even if that person was not sedentary or underactive. This was the

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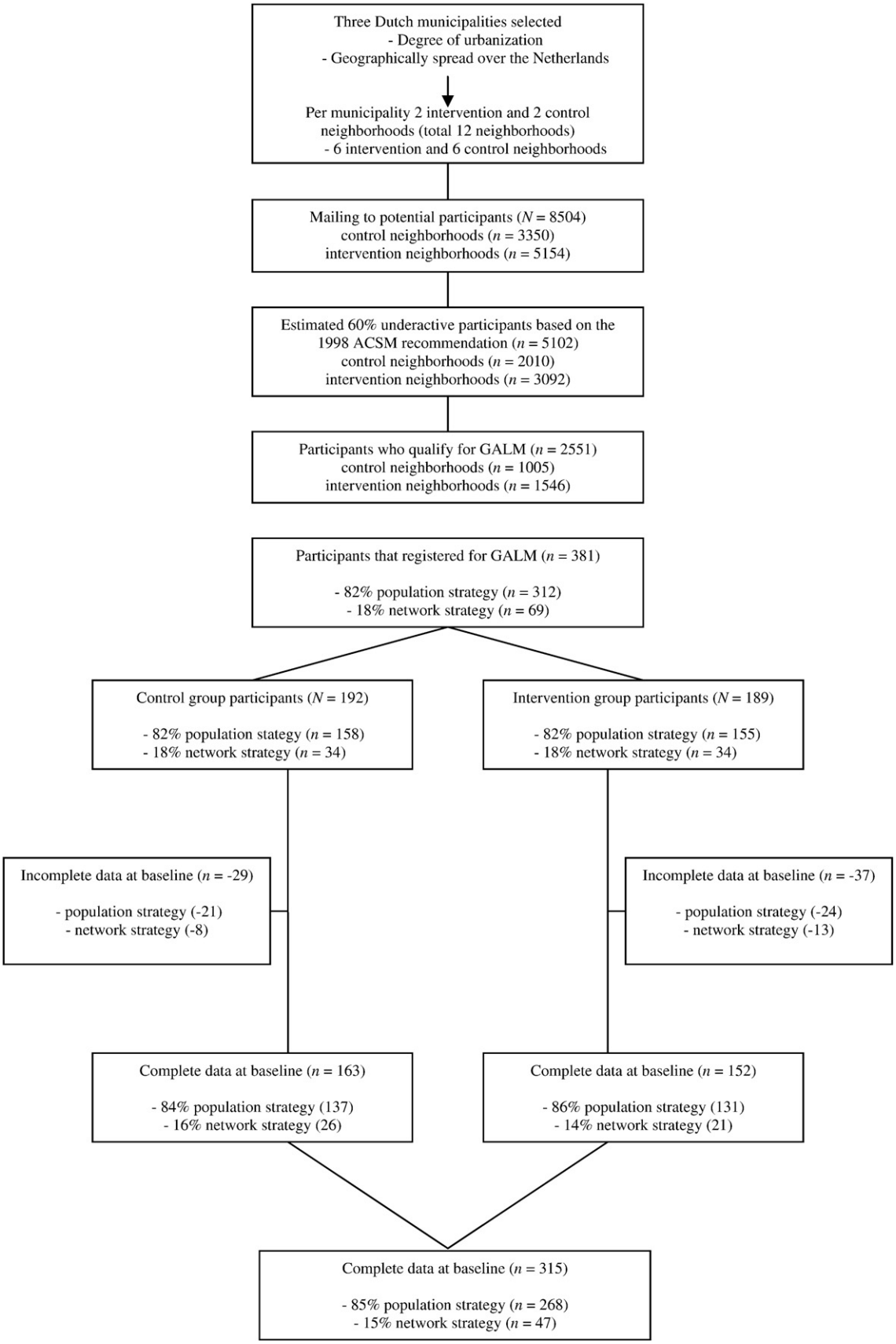


**Fig. 1.** Result of the GALM recruitment strategy (Fall 2000, The Netherlands).

network strategy. During these visits, potential participants (population and network strategy) were screened using the GALM recruitment questionnaire (Jong de et al., 1999) (available upon request), which is based on the ACSM recommendations on exercise and physical activity for older adults (ACSM, 1998).

### *Measurements*

To get an impression of the effectiveness of the strategy potential participants filled in a questionnaire (demographics, stages of change and energy expenditure). Stage of change was measured with a Dutch version of the Stages of Change questionnaire (Marcus and Owen, 1992). The five stages were reduced to three: (1) pre-contemplation; (2) contemplation/preparation; (3) action/maintenance.

Energy expenditure was measured with the Voorrips physical activity questionnaire (Voorrips et al., 1991). Intensity of recreational sports activities (e.g. swimming, volleyball) and leisure-time physical activities (e.g. gardening, walking and cycling for transportation purposes) was based on the compendium of physical activities (Ainsworth et al., 2000). The study was conducted in accordance with regulations of the local Medical Ethical Committee.

### *Statistical analyses*

Participants were categorized according to stage of change. Between-stages-of-change and intervention-versus-control-group differences were assessed with chi-square and general linear model (GLM) procedures.

## Results

In total, 8504 persons were visited. About 60% ($n=5102$) could be considered underactive according to ACSM recommendations. Based on a pilot study of the recruitment strategy it was considered that approximately half of the 60% ($n=2551$) qualified for GALM. The other half was not interested or unable to participate (personal circumstances, i.e. illness, work, nursing). Ultimately 381 were registered and 315 participated in the measurements (Fig. 1). Mean age was 59 years, 46% men and 54% women. Costs of recruitment for one subject was estimated at $84, the total cost amounted $26,570 (postage $17,600; door-to-door visits $6900; staff time $2070).

### *Stages of change and energy expenditure for physical activity*

A total of 79.4% of the participants reported being in the pre-contemplation (5.4%) or contemplation/preparation (74.0%) stages. Significant differences existed between the intervention and control groups for women and total group in the different stage groups (Table 1). For women, lowest percentages were found in stage 1 (3.3% versus 11.4%), and highest and greatest difference in stage 2 (81.3% versus 59.5%) ($\chi^2=10.42$, $p<0.01$). For total group, lowest percentages were found in stage 1 (2.5% versus 8.6%) and greatest difference in stage 2 (81.0% versus 66.4%) ($\chi^2=10.38$, $p<0.01$).

For $EE_{RECSPORT}$ and $EE_{TOTAL}$, there were significant main effects for stage ($F=39.02$, $p<0.001$ and $F=6.75$, $p<0.01$), in that stage-3 participants showed higher energy expenditure values than participants in stages 1 and 2. No main effects were found for group or stage × group ($p>0.05$).

## Discussion

We succeeded in including 12.3% of potential participants, 79.4% of whom could be considered sedentary or underactive. Although there were significant differences for women and total group between stage groups, this was concluded to be of no influence to the effectiveness of the strategy.

**Table 1**
Comparison between intervention and control groups regarding stages of change and energy expenditure for physical activity for men, women and total group (Fall 2000, The Netherlands)

| | Intervention vs. control group | | | | | | | | | Between-stage differences | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Stage 1 | | | Stage 2 | | | Stage 3 | | | *P*-value[a] | | |
| | IG | CG | Total | IG | CG | Total | IG | CG | Total | | | |
| *Participants* | | | | | | | | | | | | |
| Men (%) | 1.4 | 5.5 | 3.5 | 80.6 | 74.0 | 77.2 | 18.1 | 20.5 | 19.3 | – | | |
| (*n*) | (1) | (4) | (5) | (58) | (54) | (112) | (13) | (15) | (28) | | | |
| Women (%) | 3.3 | 11.4 | 7.0 | 81.3 | 59.5 | 71.2 | 15.4 | 29.1 | 21.8 | $\chi^2=10.42$, $p<0.01$ | | |
| (*n*) | (3) | (9) | (12) | (74) | (47) | (121) | (14) | (23) | (37) | | | |
| Total (%) | 2.5 | 8.6 | 5.4 | 81.0 | 66.4 | 74.0 | 16.6 | 25.0 | 20.6 | $\chi^2=10.38$, $p<0.01$ | | |
| (*n*) | (4) | (13) | (17) | (132) | (101) | (233) | (27) | (38) | (65) | | | |
| Mean (SD) | | | | | | | | | | Effects[a] | | |
| | | | | | | | | | | group | stage | stage × group |
| *Estimated energy expenditure for physical activity* | | | | | | | | | | | | |
| $EE_{RECSPORT}$ | 676 | 101 | 236 | 489 | 477 | 484 | 1479 | 1399 | 1432 | – | $F=39.02$, | – |
| (kcal/week) | (663) | (132) | (398) | (696) | (577) | (646) | (914) | (1309) | (1154) | | $p<0.001$ | |
| $EE_{LTPA}$ | 359 | 1573 | 1287 | 2387 | 1500 | 2001 | 2310 | 1810 | 2017 | – | – | |
| (kcal/week) | (718) | (1631) | (1541) | (2725) | (1447) | (2298) | (2786) | (1773) | (2243) | | | |
| $EE_{TOTAL}$ | 1035 | 1674 | 1523 | 2876 | 1977 | 2485 | 3789 | 3209 | 3449 | – | $F=6.75$, | – |
| (kcal/week) | (1013) | (1559) | (1447) | (2790) | (1608) | (2387) | (3172) | (2246) | (2662) | | $p<0.01$ | |

Stage 1 (pre-contemplation): 'I am not active in recreational sports activities and am not planning to be'.
Stage 2 (contemplation/preparation): 'I am not active in recreational sports activities but am thinking about starting within 6 months' or 'I am not regularly active in recreational sports activities' (less then once a week or less than 60 min per session).
Stage 3 (action/maintenance): 'I have been regularly active in recreational sports activities in the past 6 months' (at least once a week and at least 60 min per session) or 'I have been regularly active in recreational sports activities for more than 6 months' (at least once a week and at least 60 min per session).
IG, intervention group.
CG, control group.
SD, standard deviation.
$EE_{RECSPORT}$, energy expenditure for recreational sports activities.
$EE_{LTPA}$, energy expenditure for leisure-time physical activities.
$EE_{TOTAL}$, total energy expenditure for physical activities: $EE_{TOTAL}=EE_{RECSPORT}+EE_{LTPA}$.
[a] Not significant ($p>0.05$, 2-tailed) unless otherwise noted.

In the Lifestyle Interventions and Independence for Elders pilot (LIFE-P) a recruitment rate of 13.5% is reported (Katula et al., 2007). In the Perth Active Living Seniors Project (PALS) rates are reported of 12.6% and 14.5% for intervention and control groups (Jancey et al., 2006). GALM results can be considered in line with these studies, although GALM focuses on "younger" older adults. Recruitment rates between intervention and control neighborhoods in GALM were 16.2% (163/1005×100%) and 9.8% (152/1546×100%), respectively. This lower percentage for the control group can be explained by the fact that, in absolute numbers, control neighborhoods consisted of more persons to anticipate on a lower response, as these were placed on a waiting list first.

Compared with PALS, GALM showed a more equal distribution of 46% men and 54% women vs. 37% men and 63% women, respectively. Explanation for this may be that PALS recruited with the perspective of joining a walking program that was found to be more appealing to women, while GALM offered a versatile recreational sports activity program that attracted both sexes (Stevens et al., 1999).

In LIFE-P and PALS, the estimated cost of recruiting one person was $439 and $30, respectively. Costs in GALM were estimated at $84. GALM and PALS include project staff time, which was not the case in LIFE-P. It can be concluded that GALM is an inexpensive way to enroll participants relative to other screening approaches (Ory et al., 2002).

Based on results of the Stages of Change and Voorrips questionnaires, it can be concluded that the strategy was effective. A total of 79.4% of the participants reported being in the pre-contemplation or contemplation/preparation stage. The remaining 20.6% were in the action/maintenance stage, and approximately half of them were recruited by means of the network strategy (intervention group 57%, control group 44%). The other half can be the result of not filling out the recruitment or the Stages of Change questionnaires correctly, therefore being miscategorized. This may also apply to the pre-contemplation stage, which can be considered a limitation of the strategy.

With respect to estimated energy expenditure, it is concluded that contemplation/preparation stage participants had significantly lower $EE_{RECSPORT}$ than action/maintenance stage participants. No significant differences were found for $EE_{LTPA}$. This does not contradict our expectations, since GALM makes a distinction between active and sedentary or underactive based on recreational sports activity behavior. These results confirmed that the main target group of GALM, the contemplation/preparation stage participants, can indeed be considered as less active.

## Conclusion

The GALM recruitment strategy is a potentially useful and effective method for reaching community-dwelling sedentary and underactive older adults.

### Conflict of interest

The authors declare that there are no conflicts of interest.

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## References

Ainsworth, B.E., Haskell, W.L., Whitt, M.C., et al., 2000. Compendium of physical activities: an update of activity coded and MET intensities. Med. Sci. Sports Exerc. 32, S498–S504.

American College of Sports Medicine Position Stand, 1998. Exercise and physical activity forolder adults. Med. Sci. Sports Exerc. 30, 992–1008.

Jancey, J., Howat, P., Lee, A., et al., 2006. Effective Recuitment and retention of older adults in physical activity research: PALS study. Am. J. Health Behav. 30, 626–635.

Jong, de J., Stevens, M., De Greef, M.H.G., et al., 1999. GALM questionnaire to select sedentary seniors: reliability and validity. Med. Sci. Sports Exerc. 31, S379.

Katula, J.A., Kritchevsky, S.B., Guralnik, J.M., et al., 2007. Lifestyle Interventions and Independence for Elders pilot study: recruitment and baseline characteristics. J. 0Am. Geriatr. Soc. 55, 674–683.

Marcus, B.H., Owen, N., 1992. Motivational readiness, self-efficacy and decision-making for exercise. J. Appl. Soc. Psychol. 22, 3–16.

Ory, M.G., Darby Lipman, P., Karlen, P.L., et al., 2002. Recruitment of older participants in frailty/injury prevention studies. Prev. Sci. 1, 1–22.

Rowland, R., Fisher, K., Green, M., et al., 2004. Recruiting inactive older adults to a neighbourhood walking trial: the SHAPE project. J. Aging Stud. 18, 353–368.

Stevens, M., Bult, P., Greef de, M.H.G., Lemmink, K.A.P.M., Rispens, P., 1999. GALM: stimulating physical activity in sedentary older adults. Prev. Med. 29, 267–276.

Voorrips, L.E., Ravelli, A.C., Dongelmans, P.C., Deurenberg, P., van Staveren, W.A., 1991. A physical activity questionnaire for the elderly. Med. Sci. Sports Exerc. 23, 974–979.